Pre-Exposure Prophylaxis for HIV- Are We One Step Closer?

Haris Riaz[1]

[1]*House Officer, Department of Medicine, Civil Hospital Karachi, Karachi, Pakistan*

BACKGROUND

Despite the existing strategies for primary prevention of HIV such as the use of condoms, rate of HIV transmission in many areas of the world, such as Sub-Saharan Africa, remains high. Thus, besides the implementation of the available strategies, development of novel ways to counter the infection is a long awaited quest.

WHY WERE THESE STUDIES NECESSARY?

Two randomized controlled trials (RCTs) suggested that the combination of tenofovir and emtricitabine (TDF-FTC) compared to placebo were effective in preventing HIV transmission in men who have sex with men [1] and in heterosexual women [2]. However, the findings from other studies were disparate. To address the question, three large RCTs were conducted and have been recently reported in the New England Journal of Medicine. These include the Partners Pre-exposure Prophylaxis study (PrEP) in East African HIV-1 discordant heterosexual males and females [3], the FEM-PrEP (a study similar to PrEP but only in females) [4] and the TDF2 study (a study of tenofovir and emtricitabine versus placebo in Botswanian heterosexual males and females) [5].

WHAT DID THESE STUDIES FIND?

The PrEP study reported a 67% relative reduction in the incidence of HIV-1 infection (95% CI 44% to 81%, p<0.001) in the TDF group, whereas 75% in the TDF-FTC group (95% CI 55% to 87%, p<0.001). The differences in results between the two studies were not statistically different (p=0.23). Surprisingly, the FEM-PrEP trial was terminated early because it did not show any statistical difference between TDF-FTC versus placebo groups (95% CI, RR= 0.59-1.52, p=0.81). The rates of adverse effects such as nausea, vomiting or elevated alanine aminotransferase were significantly greater in the TDF-FTC groups compared to placebo (p=0.04, p<0.001 and p=0.03) respectively. The TDF2 study, similar to the PrEP study, showed a promising effect of TDF-FTC administration with a 62.2% efficacy (95% CI= 21.5-83.4, p=0.03). However, unlike the PrEP and similar to the FEM PREP study, the adverse effects were significantly greater in the treatment compared to the placebo group.

IMPLICATIONS

These studies have direct clinical relevance to the patient care. Based on the results of these studies, the Food and Drug Administration (FDA) recommended that the combination of TDF-FTC can be used for pre-exposure prophylaxis of HIV-1 [6].

LIMITATIONS AND FUTURE DIRECTIONS

The studies had disparate results necessitating the need for further studies to better determine the efficacy of TDF either alone or in combination with FTC. Furthermore, the safety of these agents including the effect on the bone and mineral density is unknown. Future studies should address these questions along with the identification of highest risk populations and the determination of dosing strategy for optimal response.

REFERENCES

1. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587-2599.
2. Peterson L, Taylor D, Roddy R, et al. Tenofovir disoproxil fumarate for prevention of HIV infection in women: a phase 2, double-blind, randomized, placebo-controlled trial. *PLoS Clin Trials* 2007;2:e27-e27.
3. Baeten JM, Donnell D, Ndase P, et al. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. *N Engl J Med* 2012;367:399-410.
4. Van Damme L, Corneli A, Ahmed K, et al. Preexposure prophylaxis for HIV infection among African women. *N Engl J Med* 2012;367:411-422.
5. Thigpen MC, Kebaabetswe PM, Paxton LA, et al. Antiretroviral preexposure prophylaxis for heterosexual HIV transmission in Botswana. *N Engl J Med* 2012;367:423-434.
6. Grady D. F.D.A. advisory panel backs preventive use of H.I.V. drug. New York Times. May 10, 2012:D5.

Conflict of Interest: None declared

This article has been peer-reviewed.

Article Submitted on: 14th August 2012

Article Accepted on: 27th August 2012

Funding Sources: None declared

Correspondence to: Dr. Haris Riaz

Address: Department of Medicine, Civil Hospital Karachi, Karachi, Pakistan

Email: harisriaz73@yahoo.com

Cite this article: Riaz H. Pre-exposure prophylaxis for HIV - are we one step closer? J Pak Med Stud 2013; 3(1):33